



**AN ASSESSMENT OF EFFECTIVENESS OF  
Aadhar ENABLED PUBLIC DISTRIBUTION  
SYSTEM(AePDS) IN FORBESGANJ BLOCK  
OF ARARIA**

***Presented By-***

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This is to certify that Aditya Utpal Jha, a student of Indian Institute of Management (IIM), Shillong, has satisfactorily concluded the research report titled “**An Assessment of Effectiveness of Aadhar Enabled Public Distribution System (AePDS) in Forbesganj Block of Araria District, Bihar**” as part of the internship program at the National Centre for Good Governance (NCGG) under my mentorship.

I, Dr. Roma Debnath, hereby validate the successful completion of the internship report within the internship program at the National Centre for Good Governance (NCGG). The report submitted by Aditya Utpal Jha is an authentic work carried out by him under my supervision and guidance. I have reviewed and assessed the intern's performance throughout the internship period.

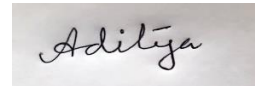
  
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## **Abstract**

The public distribution system (PDS) in India acts as the instrument to ensure food security for the people in the country. The PDS was plagued with several challenges like leakages in the supply chain, fake ration cards, diversion of food grains, underselling by FPS dealers and overcharging by FPS dealers. Due to these problems, the policymakers came up with Aadhar enabled public distribution system (AePDS) which is designed to make sure that grains are distributed to the underprivileged in an effective and transparent manner. This study uses the Service Quality (SERVQUAL) model to measure satisfaction of the end beneficiaries with the AePDS in order to determine how effective AePDS is in Forbesganj Block of Araria District, Bihar. Five factors make up the SERVQUAL model, which assesses service quality: tangibles, assurance, responsiveness, consistency and empathy. The study also tries to understand the point-of-view of the FPS dealers and district PDS officials with regard to AePDS. The results obtained using SERVQUAL model will be then used to assess the satisfaction rate of the beneficiaries and identify the areas of concerns.

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## List Of Abbreviations

<b>Abbreviations</b>	<b>Definitions</b>
AAY	Antyodaya Anna Yojana
ABBA	Aadhar Based Biometric Authentication
AePDS	Aadhar enabled Public Distribution System
APL	Above Poverty Line
BPL	Below Poverty Line
DSO	District Supply Officer
e-PoS	e-Point-of-Sale
FCI	Food Corporation of India
FPS	Fair Price Shop
MO	Marketing Officer
MSP	Minimum Support Price
NFSA	National Food Security Act
NITI	National Institute for Transforming India
OBC	Other Backward Classes
ONOR	One Ration One Nation
PDS	Public Distribution System
PHH	Priority House Hold
RFID	Radio Frequency Identification
SC	Schedule Caste
SERVQUAL	Service Quality
SFC	State Food Corporation
ST	Schedule Tribe
TPDS	Targeted Public Distributed System



# **1.Introduction**

## **1.1 Background**

Public Distribution System (PDS) in India is a system of food grains distribution which is intended to make India food secure and deals with the problems of poverty (Mooij, 1994). India, despite its economic and scientific achievements, continues to remain a poor country on a per capita basis where 13% of its population still earning below than the poverty line (World Bank, 2021). PDS was started after the independence in 1950 by then central government as a way to provide grains, oil to the poorest of the poor in the country. To achieve its goals, a vast network of warehouses to store grains were constructed all around the country and the people were required to have a below poverty line (BPL) card in order to be eligible for receiving the grains. In PDS, the central government purchases grains like rice and wheat from food surplus states like Punjab and Haryana at minimum support price (MSP) and then sells it to the states at the price decided by the centre. Then the state governments through a network of state-owned warehouses, food corporation of India (FCI) warehouses and some private warehouses distributes the grains to various districts of the state. Then the grains are distributed to the people at a highly subsidised price through a network of fair price shops (FPS) which are the licensed dealers to sell the grains. These shops are the point-of-sell (POS) of the grains and they are required to maintain a register of the names of the beneficiaries. Currently, there are close to 5.38 lakhs fair price shops all across the country (Ministry of Consumer Affairs, Food & Public Distribution,2021).

The PDS system that was started by the government was laced with issues right from the beginning. Major issues were bogus ration cards, leakages in the supply chain and the diversion of the food grains away from the intended beneficiaries. The diversion problem was so severe that during 90s, up to 67% of the grains were diverted away from the genuine beneficiaries (Gulati and Saini, 2015). Also, many people belonging to above poverty line (APL) used to make fake ration cards to avail the grains at a subsidised rate and then they used to sell those grains in the open market at a higher price. This posed a significant problem before the policymakers. To curb these issues and to bring more transparency in the system, the government came with a system of targeted public distribution system (TPDS) whose aim was to identify priority household (PHH) in every part of the country who were in dire need of food security and each member of those households were entitled to 5kg of grains. The state administration was tasked with to identify the PHH and to ensure that the transparency is maintained in issuing the ration cards. Further in 2000, antyodaya anna yojana (AAY) was started by the government in which the poorest 1 crore households in the country were eligible for 35 kgs of grains. The slab was further increased to include 40 lakhs other households in 2003 and then 1 crore were further added to AAY list in 2008 increasing the total beneficiaries to 2.4 crore families. This proved to be a decisive step in the direction to ensuring the food security of the poorest of the poor. Several researches were conducted to find out whether the intake of the beneficiaries was increasing and that showed an upward trend. People belonging to SC/ST communities which earlier were not able to procure the grains were now able to procure grains under the new scheme (Kumar et.al, 2016). These new schemes also had some issues relating to duplication of ration cards and issuing of fake ration cards, but due to the targeted nature of these schemes, the beneficiaries were now identified with more precision.

Some states introduced some novel measures to deliver grains to the actual beneficiaries. Bihar government introduced a coupon system in place of ration cards in which each beneficiary was provided with 12 coupons for the entire year (i.e, 1 /month) to avail the food grains (Choithani and Pritchard, 2015). Tamil Nadu government increased the scope of the PDS to include most of its population effectively curbing the motivation to use bogus cards to get the benefits of TPDS.

Although, these new schemes did buy in some transparency in the system, the bigger problem still remained, the diversion of the grains. And the consequences of that were delays in the issuing of grains, delivery of sub-standard grains and rotting of grains in the warehouses. This needed a complete overhauling of the supply chain of PDS. Analysis of PDS found that at about 55% of the subsidised food grains issued from the central pool do not reach the BPL families because of identification errors, non-transparent operation and unethical practices in the implementation of TPDS (Ramaswami and Murugkar, 2015).

With the advent of technology and it becoming cost-effective, government started to look for options to reduce leakages in the supply chain. Keeping that in mind, the government started using GPS tracking devices in the carriages that carry food grains be it through roadways or railways (“GPS to be used to track distribution of PDS commodities”, 2015). The bags containing grains were also GPS tagged to reduce any kind of theft. There are two kinds of contractors who operate in the entire supply chain of PDS. Level-1 contractors for transferring the grains from APMC mandis to centrally owned FCI warehouses and Level-2 contractors for transferring the grains from FCI warehouses to various state warehouses. Fresh tenders were issued for the contractors and more thorough background checks were conducted for the selection of contractors. These things helped in the reduction of leakages to some extent. Now, government is thinking of using radio frequency identification (RFID) tagging for more transparency in the supply chain. Pilot tests are also being conducted to leverage blockchain technology in PDS (Biswal et.al, 2018).

Up until 2013, PDS was just one of the government schemes that functioned as the government instrument to fulfil the food requirements of the people of the country. It finally came under an act by the parliament in 2013 which was the National Food Security Act (NFSA). This act made the PDS function with more efficiency as the scrutiny had now increased multi-fold. The NFSA proceed to include 75% of the rural population and 50% of the urban population in PDS making it effectively the largest food distribution system in the entire world. Some states like Bihar had 80% of total population covered in this scheme (NFSA,2013).

## **1.2 Aadhar enabled Public Distribution System (AePDS)**

The Government of India implemented AePDS in 2015 in accordance with the end-to-end computerization policy. This gave the end users the privilege to check for themselves their entitlements and helped the PDS officials to keep an account of the disbursement of the grains and curb any issues in the system. Several initiatives like e-point of sale (e-POS) where the grains are electronically weighed and that information is automatically shared with the government officials (Gayatri, 2015). According to Indian Express, Aadhar based biometric authentication (ABBA) was first started in Jharkhand as that state reported maximum number of fake ration cards ("Aadhaar or else" (2024)). Andhra Pradesh became the first state in the

country to mandate ABBA in all the districts of the state Prabhakar et.al (2021). The technological infrastructure is based on Aadhar seeding with the Ration card followed by a retina scan to create a unique digital identity for the user to avail the PDS services. After the successful procurement of the grains, a message is sent to the user regarding the successful lifting of grains. The users can now access the details of their transactions on the e-PDS portal of their state of residence. With the implementation of the one nation one ration (ONOR) scheme, people can now avail their ration from any of the fair price shops in the states instead of their designated FPS curbing the monopoly of the FPS dealers. Aadhar enabled PDS (AePDS) has enabled all the stakeholders in the PDS to avail the information about disbursement of grains reducing the information gap to a large extent and increasing transparency in the process. The study covers a number of AePDS system characteristics, including infrastructure, digitization, payment modes, acts and schemes, and monitoring.

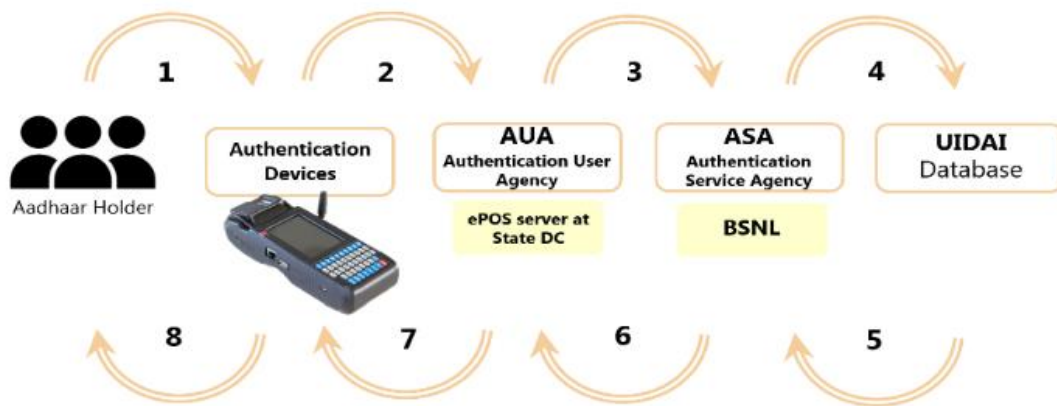


Figure 1. AePDS Architecture (Gupte and Doctor (2022))

### 1.3 Public Distribution System in Bihar

The Public Distribution System in Bihar is managed by Food and Consumer Protection Department, Government of Bihar. As of May,'24, following table gives an idea about PDS transactions.

Table 1. PDS Transactions in Bihar as of 22<sup>nd</sup> May 2024

PDS Transactions	
<b>Total Cards</b>	19519210
<b>Availed Cards</b>	12664665
<b>Portability Cards</b>	6382549
<b>Total Shops</b>	52267
<b>Active Shops</b>	14211

Source: Food and Consumer Protection Department, Government of Bihar

#### **1.4 Objectives**

- 1) To understand the effectiveness of AePDS system as perceived by the end user in Forbesganj block with reference to its responsiveness, timeliness and transparency.
- 2) To understand the barriers of AePDS and challenges faced by FPS owners and PDS officials in Araria district in terms of service delivery.
- 3) To provide suggestions for improvement of AePDS service delivery in Araria District.

#### **1.5 Research Questions**

- 1) What is the quality of PDS services as observed by the end user?
- 2) What are the differences in the experiences of end users pre-AePDS and post-AePDS in terms of delivery of the service?
- 3) What is the level of technological infrastructure in FPS shops and awareness about it?
- 4) What are the common problem areas as reported by the FPS owners and end users to the PDS officials and what are the steps taken to solve them?
- 5) What are some unexpected problems experienced by FPS owners and PDS officials in service delivery and what are some examples of creative solutions in the field?
- 6) What are the differences in the experiences of FPS owners and PDS officials pre-AePDS and post-AePDS in terms of delivery of the service?

#### **1.6 Research Methodology**

The model which we have used in this study is SERVQUAL (Service Quality) Model. This tool functions on the concept of Expectations and Perception about a service that is offered to someone and is used primarily for measuring and analysing service quality. This tool is one of the most preferred tools when it comes to satisfaction surveys. Often used as a credible tool for surveys in higher education, healthcare, banking, and tourism, this tool might give us insights about what is the service quality provided by AePDS to the end beneficiaries and this will help us identify the gaps in the service delivery. This model was developed by Parasuraman, Zeithaml, and Berry in 1988, the model focuses on five key dimensions of service quality namely- Tangibles, Reliability, Responsiveness, Assurance and Empathy. It employs the use of Likert Scale to gather the opinions of the respondents about the particular service that they are using. A simple questionnaire was prepared based on this model and the respondents (PDS users) were asked to give ratings based on their experiences.

#### **1.7 Data Collection Methods**

The data collection was done in two stages:

- 1) A pilot survey of 30 households in Forbesganj block was first done to calculate the standard deviation for deciding on the number of samples that will be required for the research process.
- 2) Questionnaire based on SERVQUAL model was prepared for PDS beneficiaries and field survey was conducted in different Gram Panchayats of Forbesganj block namely- Sahbazpur, Pothia, Rampur North, Saifganj.

Data was collected using a google form which contained information regarding the demographics and SERVQUAL and used primarily multiple-choice questions (MCQ).

## **1.8 Questionnaire Design**

Questionnaire for PDS users/beneficiaries:

This questionnaire was based on SERVQUAL model and tried to assess the services offered by AePDS on the accounts of Awareness of the service, service quality and reliability, problem resolution and satisfaction. Regarding the comparison during pre- and post-AePDS part, the beneficiaries were asked to share their experiences with both the systems and based on that the efficacy will be determined.

Questionnaire for FPS dealers and PDS Officials:

Qualitative questions were asked to the FPS owners and PDS officials regarding the technological infrastructure of AePDS, its issues and how it has impacted the delivery of grains and what challenges lie ahead. Regarding the comparison during pre- and post-AePDS part, the PDS officials and FPS owners were asked to share their experiences with both the systems and based on that the efficacy will be determined.

## **1.9 Sampling**

Based on the pilot study conducted above, we found out that optimum number of households for a 95% confidence interval and 10% error margin is 130.

The sampling method used is multistage random sampling.

Stage 1- The list of all FPS shops in Forbesganj was taken from district PDS officials and 10 FPS shops were taken using random sampling.

Stage 2- The list of 13 people each were taken from each FPS using random sampling.

And regarding the PDS officials, a detailed interview was taken of Marketing Officers.

## **2. LITERATURE REVIEW**

### **2.1 PDS in India**

Public Distribution System in India has undergone many changes since its inception and many papers have been published to highlight the efficiency of it in ensuring the food security in the country and many different approaches have been taken to achieve that goal.

Pal (2011) analysed the organisational structure of PDS system in India and tried to find out the loopholes in the functioning of Food Corporation of India (FCI) and Central Warehouse Corporation in the storage, transportation and distribution. The paper found out that the PDS is not equipped with proper storage and transportation facilities. And thus, many private players are now engaged in the transportation and storage facilities. The paper also discussed that many fair price shops were giving only rice and wheat and other commodities were not available.

The National Food Security Act (NFSA), when passed in September, 2013 relied on Targeted Public Distributed System (TPDS) for efficient distribution of the entitlements of the commodities to the beneficiaries. Balani (2013) discussed the functioning of TPDS and explored challenges in the functioning of TPDS and recommend some alternatives to it. The paper found out that “PDS suffers from nearly 61% error of exclusion and 25% inclusion of beneficiaries”. It also discussed some of the steps some states have taken to ensure that TPDS works smoothly like Tamil Nadu implemented a universal PDS which meant every household was eligible for the subsidised food grains. States such as Chhattisgarh and Madhya Pradesh have implemented IT measures for streamlining the TPDS services in the state. The paper discussed the possible alternatives to the TPDS system which included food coupons and cash transfers.

Public Distribution System in India can also be analysed through SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and it yielded the results that use of ICT solutions under ‘Digital India’ initiative was vital in offering strategy alternatives in improving the supply chain of PDS in India (Bohtan et.al,2017). A paper by George and McKay (2019) highlighted the failures in Public Distribution System in India at the policy level by analysing 23 articles based on PDS in India. It compared India, China and Brazil on the food security front and highlighted how India can learn from the best practices in these countries. PDS has been incurring losses at each step in its entire supply chain. FCI Godown storing cost was 70% more than free market and transportation of grains was mainly done through rail (close to 90% of total supplies). The losses during transportation amounted to 0.196 MT or Rs 333 Cr in 2011-12 (Bohtan et.al,2020). The reasons listed in this paper were stock deterioration due to improper storage.

### **2.2 Technical Innovations in PDS**

Innovations in the supply chain meant that less diversion of food grains and timely distribution of grains to ensure the nutritional needs of beneficiaries are met.

Efficiency improvement of supply chain has been cited as one of the major things that needed attention due to its complex nature as multiple stakeholders are involved in it (Chandes and Pache,2010). There have been talks of using Radio Frequency Identification (RFID) technique in the management of inventory levels for ensuring optimum levels of grains is available for

distribution and that would lead to reduction in delays caused due to low levels of inventory in warehouses (Biswal et.al, 2018). The paper also discussed the idea of attaching RFID tags at the packet level for tracking the stock on a real basis.

Another possibility of using technology in improving the supply chain is the adoption of Blockchain to manage the supply of food grains to the targeted beneficiaries (Mishra and Maheshwari, 2021). The paper tried to propose a theoretical framework for the application of blockchain in PDS system in India to manage the supply of food grains. Smart contracts are a useful tool for increasing efficiency and automating procedures in a blockchain-based PDS. Before being implemented on the blockchain, smart contracts might need to go through a number of stages (Krishna et.al, 2021). According to this paper, Ledger writes access should only be granted to recognized players in the planned blockchain architecture for the PDS, which includes the Government of India, Food Corporation of India, central and state warehousing organizations and certified ration shop dealers.

Several studies are conducted to fix the supply-side issues that plague the PDS system in India. On such study by Das et.al (2023) focused on selecting enablers for a sustainable PDS in India. The study employed the use of DEMATEL (decision-making trial and evaluation laboratory) fuzzy approach to create a causal model that examined the interactions between the identified enablers. 'Proper identification of the PDS beneficiaries' and 'willingness and commitment of the top management and policymakers' were identified as the two primary enablers for sustainable PDS supply chains. A literature survey and expert comments were used to identify fifteen other enablers. By addressing the primary drivers for sustainable PDS supply chains and offering managerial implications for analysing, choosing and carrying out sustainable activities, the study tried to bridge a theoretical gap.

### **2.3 PDS in Bihar**

Bihar is one of the poorest states in India with majority of its population coming under beneficiaries of PDS (National multidimensional Poverty Index (NITI Aayog), 2023) and hence it becomes extremely crucial that this system works smoothly in the state.

There have been several innovations in PDS system that aimed to ensure the genuine beneficiaries are given the entitlements. In the realm of Targeted Public Distribution System (TPDS), to make the distribution process more efficient, state government of Bihar came up with Coupon system effectively replacing ration cards in 2008 (Pankaj, 2015). The aforementioned paper was based on a study that assessed the new method based on a panel survey that was carried out in 18 villages spread over three districts in Bihar. It contended that there were four reasons why the innovation had succeeded: Power dynamics in distribution of food grains that existed between influential FPS dealers got shifted towards beneficiaries, leakages had decreased, beneficiaries had gained authority through the availability of information and supply-driven distribution channels were now under demand-side pressure from the beneficiaries. However, there were many problems with the coupon system that was introduced in Bihar. Beneficiaries were not able to use all of their coupons because of delayed delivery of grains where around 50% of BPL and AAY cardholders reported they had to wait for 3 months to get 1 month ration and FPS owners demanded additional coupons from the

beneficiaries for the same amount of allotment as reported by 60% of the households (Choithani and Pritchard, 2015).

A study conducted by Kumar et.al (2016) on PDS system in Bihar used secondary data from the 50th (1993–1994), 61st (2004–2005), 66th (2009–2010) and 68th (2011–2012) rounds of the Consumption and Expenditure Survey conducted by the National Sample Survey Organization (NSSO) of the Government of India (GoI). The results based on analysis from the NSSO data and microlevel evidences collected from targeted villages in Bihar indicated a significant positive change in PDS functioning of the state. It was based on the fact that the calorie intake of the beneficiaries had increased significantly and the outreach of PDS system had widened which was evident from the participation of marginalised sections of the society.

A study by Dar et.al (2018) on the corruption in Public Distribution System in Bihar showed that 36% of households reported at least one family member had gone hungry in the last 30 days due to lack of food. 67% of the households reported that they were not getting ration timely and on average 2.5 kg of ration was not received by the households.

#### **2.4 AePDS and e-PoS in PDS system**

With the advent of new technologies like digitisation of entire Public Distribution System, it becomes imperative that there is a need for studies that aim at studying the satisfaction of the PDS beneficiaries with this new system in the remotest corners of the country.

Prabhakar et.al (2021) of National Institute of Rural Development and Panchayati Raj (NIRDPR) conducted a study for whole of Andhra Pradesh to determine the effectiveness of Aadhar enabled Public Distribution System (AePDS) which contains electronic and cashless transaction from the perspective of the end beneficiary of PDS using Citizen Report Card (CRC) approach. The study focused on systematically assessing the quality, responsiveness and effectiveness of e-PoS (AePDS) and cashless service delivery of PDS services provided by Fair Price Shops to the general population. It also focused on the challenges faced by the FPS dealers/owners and staff of Department of Consumer Affairs, Food & Civil Supplies in their role as service provider to the people using in-depth interviews as a tool. The study also employed the use of statistical methods like Order Probit and Logit analysis to determine the satisfaction rate of the end users of PDS. It also calculated the Service Delivery Index (SDI) and used it to rank the Fair Price Shops village-wise and Mandal-wise. The study also aimed at finding the differences in the experiences of the stakeholders involved in PDS system in pre-AePDS and after AePDS implementation. The study revealed that transparency has increased in the sense that the records were readily accessible as they were digitised and the beneficiaries were getting their full entitlement unlike pre-AePDS times when there were leakages on a massive scale. Responsiveness has also increased. Based on the findings from the study, the paper concluded with recommendations for the policymakers.

Gupte and Doctor (2022) attempted to create an assessment framework for checking AePDS system's effectiveness with regards to its interaction with the general population. In the context of Raigad District in the Mumbai Metropolitan Region, the study aimed to look into how the AePDS operates at Fair Price Shops, the services offered to the beneficiaries, the use of technology, the benefits and drawbacks of the system and the infrastructure chosen to



implement the system efficiently for the process of distributing grains. The paper based the assessment framework on four parameters namely food grain distribution, infrastructure, digitization and monitoring. The Fair Price Shops were judged on the aforementioned parameters and their sub-parameters by the PDS users on a scale of 1-5. The scores were collected and a weighted average of them was taken and these scores helped in identifying the strong and weak areas of the AePDS infrastructure of the Raigad District.

A conceptual paper by Dheera (2020) discusses in detail about the impact of e-PoS machines in Kerala. The developed model provides an overview of components such as stopping the illicit sale of ration products, facilitating transactions online, recording transactions electronically, generating bills and fingerprint recognition. The research can be seen as a foundation upon which additional research on the e-PoS system's implementation might be developed.

Impact assessment of Biometric Authentication in Karnataka was done at 3300 FPSs to look at how food grain diversion at the last mile was affected by the installation of Biometric Authentication (BA) based monitoring devices between 2013 and 2015. Making Use of Using a difference-in-differences estimating technique, it was discovered that food grain diversion at the FPSs equipped with BA devices was 4% less than the baseline diversion amount (Ganesh, 2021).

A study in Manjeswar Taluk, Kasargod District, Kerala was conducted to understand the satisfaction of the PDS users, electronic initiative and the accessibility of public distribution system by the beneficiaries. It used questionnaires set according to Likert Scale method to accurately capture the beneficiary's attitude and opinions towards the government initiatives. It revealed that 66.7% of the households were satisfied with the present quality of food grains and 86% of households were positive towards the new initiatives by the Government regarding introducing e-PoS machines that have improved the weighing of grains leading to less diversion of grains (Madhusoodana and Parvathy, 2023).

### 3. Findings and Analysis

#### 3.1 End Beneficiaries

The following findings and analysis were done on the responses by 102 beneficiaries of the public distribution system in Forbesganj block of Araria district, Bihar.

#### Demographic Information:

**Age and gender of the beneficiaries:** The average age of respondents was a little over 46 years. The male population formed 78 % of total respondents while the rest was formed by female respondents.

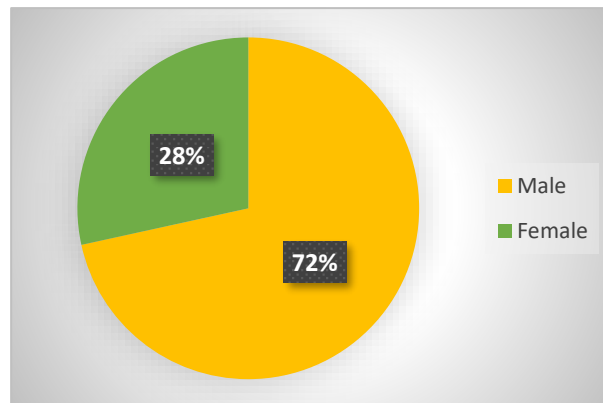


Figure 2. Gender Details

**Religion and Caste:** Most of the respondents (93%) were Hindu and rest were Muslims (7%). General caste represented 36% of the respondents followed by SC at 34% and OBC at 31%.

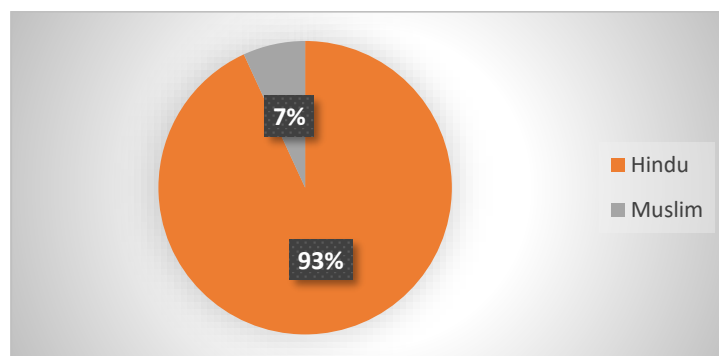


Figure 3. Religion Details

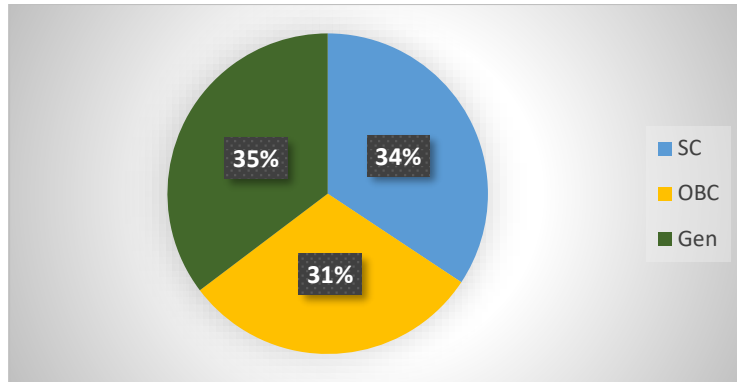


Figure 4. Caste Details

**Educational Level:** Around 30% of the respondents were illiterate followed by graduates and above and primary schooling both at around 19%. Respondents having secondary and higher secondary formed 14% and 18% respectively.

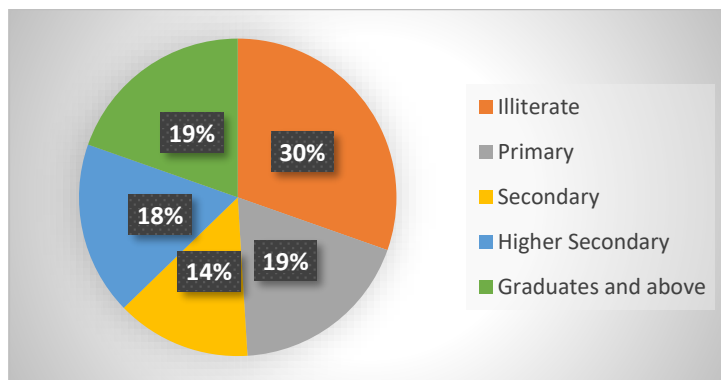


Figure 5. Educational Level

**Occupation:** Manual labour (both agricultural and non-agricultural) formed 34% of the respondents followed by farming at 13% and shop owners at 11%. Government jobs formed 8% of the total respondents.

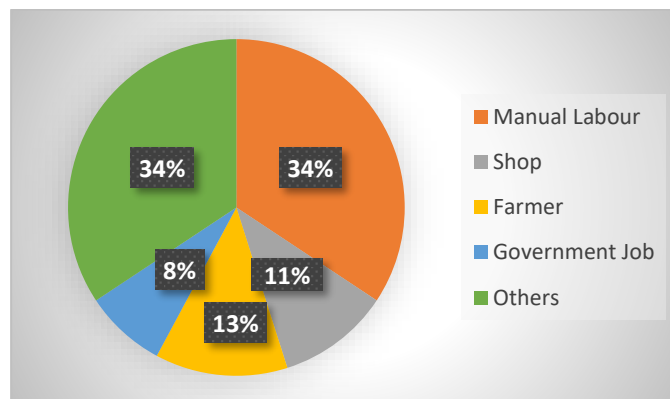


Figure 6. Occupation

**Annual Income:** Most of the respondents (69%) reported that their annual income was less than Rs 60000 annually. Respondents having annual income in the range Rs 60000-Rs 100000 formed 27% and respondents earning more than Rs 100000 formed 4% of the respondents.

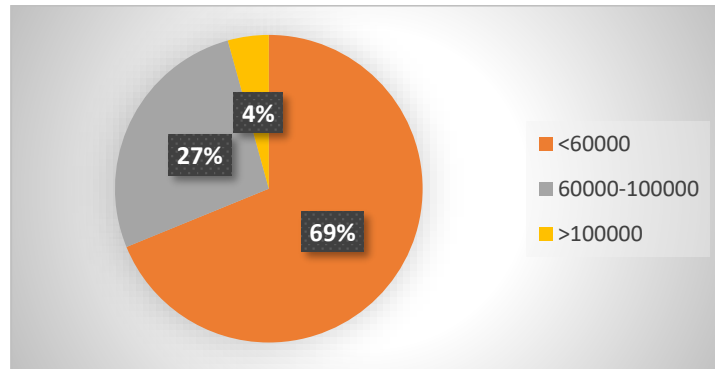


Figure 7. Annual Income

**Ownership of house:** 75% of the respondents reported having pukka house of their own most of which has been constructed under the Indira Awaas Yojana, followed by 24% reported living under kutcha house of their own and the rest reported living in rented pukka house.

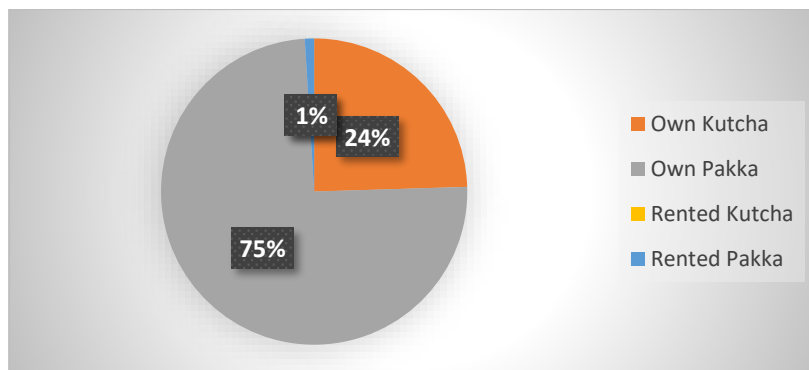


Figure 8. Home Ownership

**Ownership of Mobile:** 82% of the respondents reported owning a mobile and the numbers are encouraging because it will be easier for the government to connect with the people regarding their welfare.

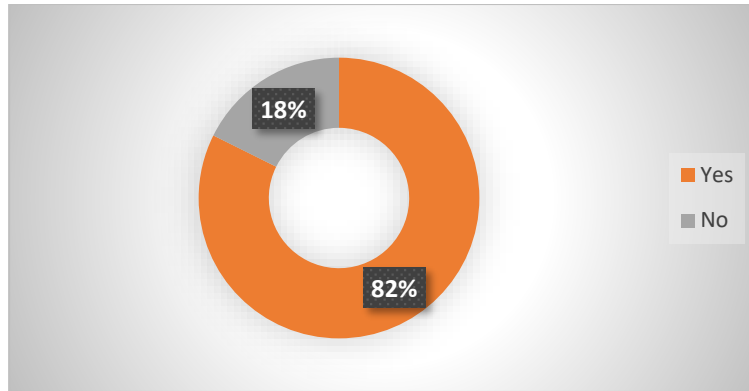


Figure 9. Mobile Phone Ownership

**Ownership of Bank account:** 96% of the respondents reported having a bank account and majority of them opened under the Pradhanmantri Jan Dhan Yoajana. Due to high number of people having bank account makes it easier for the governments for direct transfer of benefits.

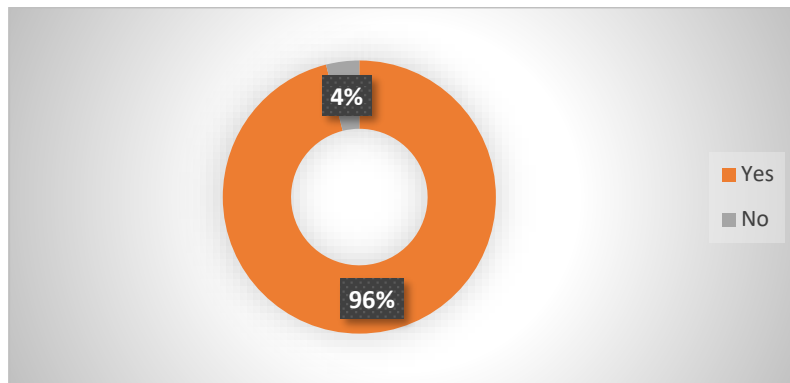


Figure 10. Bank Account

**Ownership of vehicles:** 71% of the respondents reported having a two-wheeler at home which they use for commuting purposes and carrying grains from the fair price shops. 20% of the respondents reported no vehicles for commuting and 9% reported having a three-wheeler.

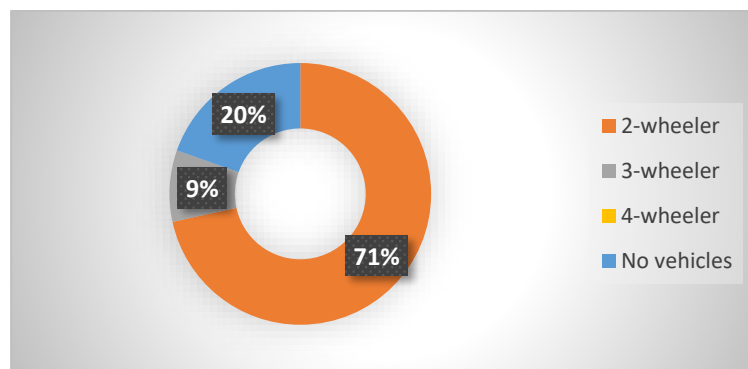


Figure 11. Ownership of Vehicles

**Toilet in house:** 97% of the respondents reported having toilets in their home marking a positive step towards making India open defecation free and just 3% of the respondents reported having no toilets installed.

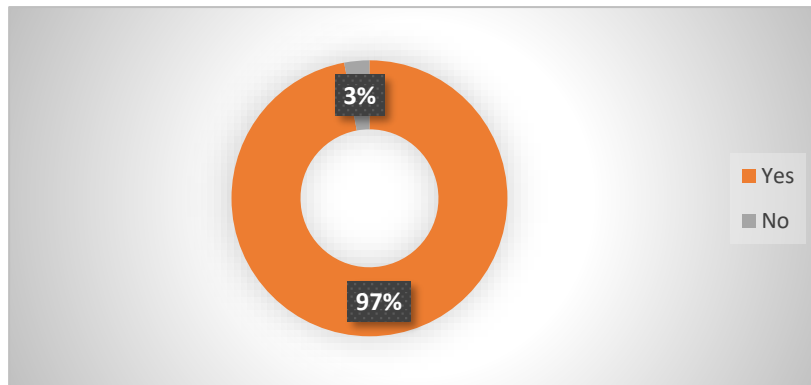


Figure 12. Toilet Availability

**Is there any debt:** 66% of the respondents reported having taken debt and 34% respondents were debt-free.

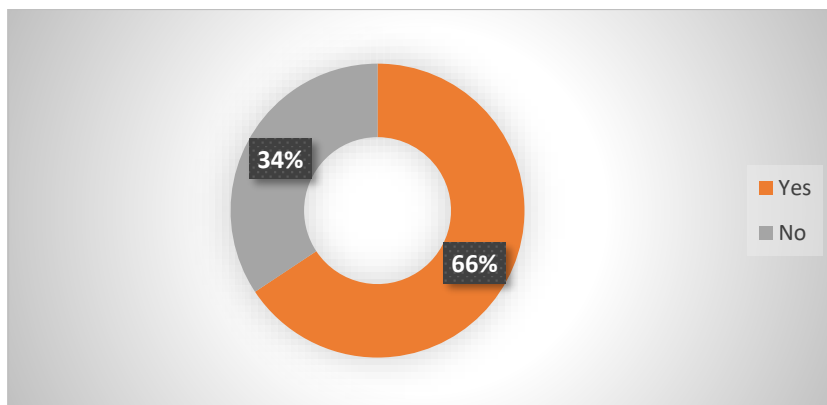


Figure 13. Debt Taken

## Fair Price Shops (FPS) and Public Distribution System (PDS) questions

**Type of card:** 77% of the respondents reported Priority Household (PHH) card and 23% reported Antyodaya Anna Yojana (AAY) card. Due to the Pradhanmantri Garib Kalyan Yojna (PMGKY), beneficiaries are getting grains completely free of cost. For PHH cardholders, its 5 kg per member of the household and for AAY cardholders, its 35 kg per household.

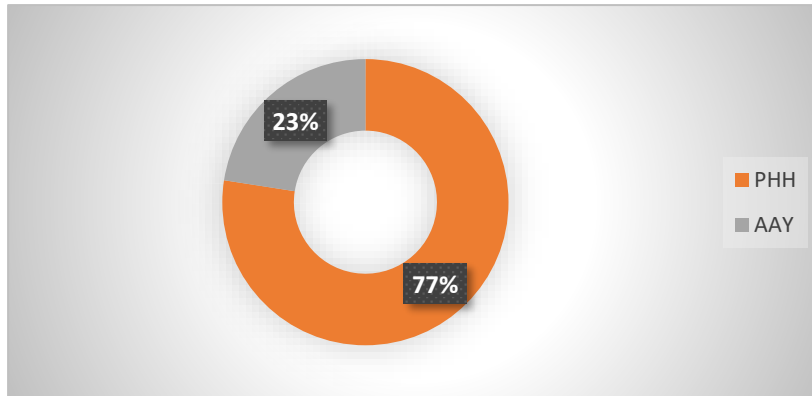


Figure 14. Type of Card

**Entitlement Awareness:** 97% of the respondents reported that they were aware of the entitlements that they must receive from the government.

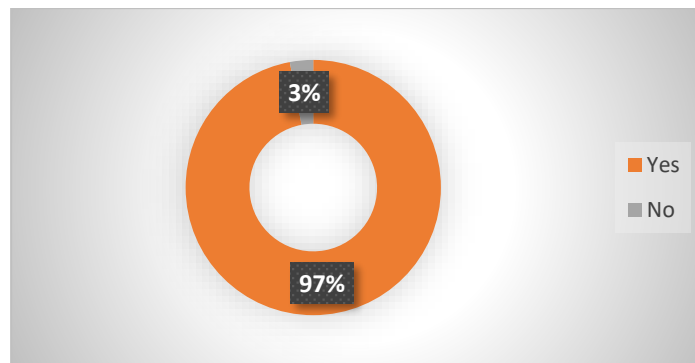


Figure 15. Entitlement Awareness

**One Ration one Nation (ORON) Awareness:** 96% of the respondents reported awareness about the ORON scheme.

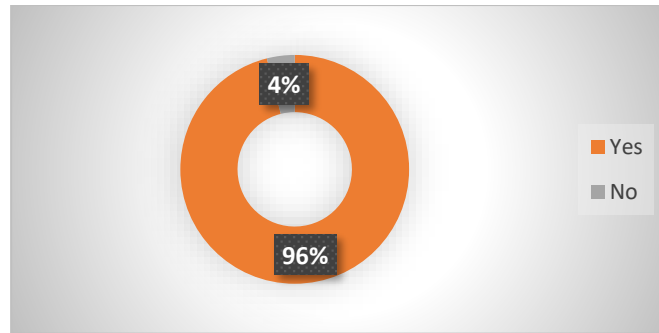


Figure 16. One ration one nation (ORON) Awareness

**Types of grains availed:** 100% of the respondents reported having availed both rice and grains.

**Availed complaints lodging facility:** 69% of the respondents reported not having availed complaints lodging facility and only 31% of the respondents availed complaints lodging facility.

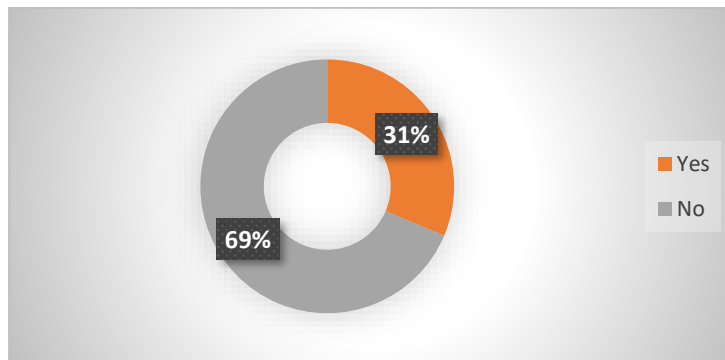


Figure 17. Availed Complaints Lodging Facility

**Mode of information of grain distribution:** 65% of the respondents reported that they didn't receive any information when will the grains is going to be distributed followed by 35% who reported that FPS dealers tell them when is the grain distribution going to take place.



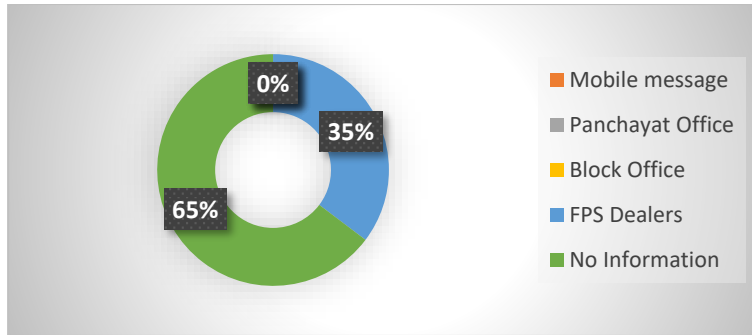


Figure 18. Mode of Information of Grain Distribution

**FPS dealers underselling:** Around 90% of the respondents reported that FPS dealers undersell either often or rarely.

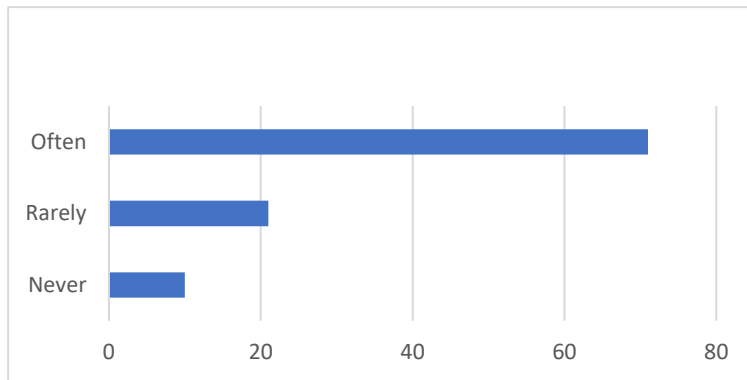


Figure 19. FPS Dealers Underselling

**FPS Dealers overcharging:** Around 80% of the respondents said that the FPS owners have never overcharged them.

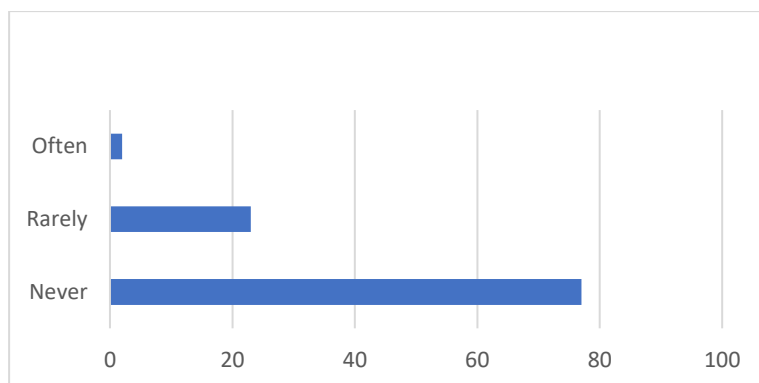


Figure 20. FPS Dealers Overcharging

**Vigilance Cell Awareness:** 58% of the respondents reported having no knowledge about the vigilance cell that checks the fair price shops at regular intervals.

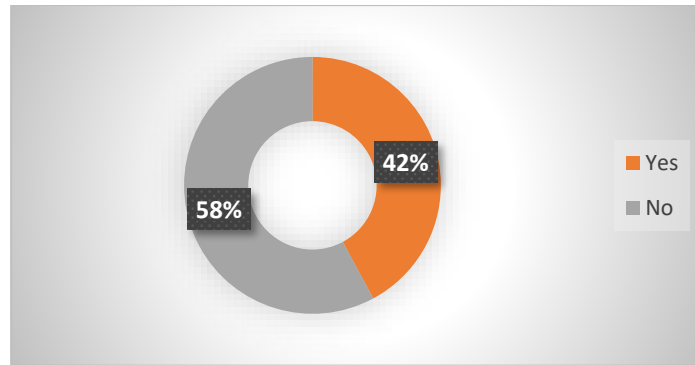


Figure 21. Vigilance Cell Awareness

**FPS service delivery satisfaction:** Around 70% of the respondents are satisfied with the FPS service delivery.

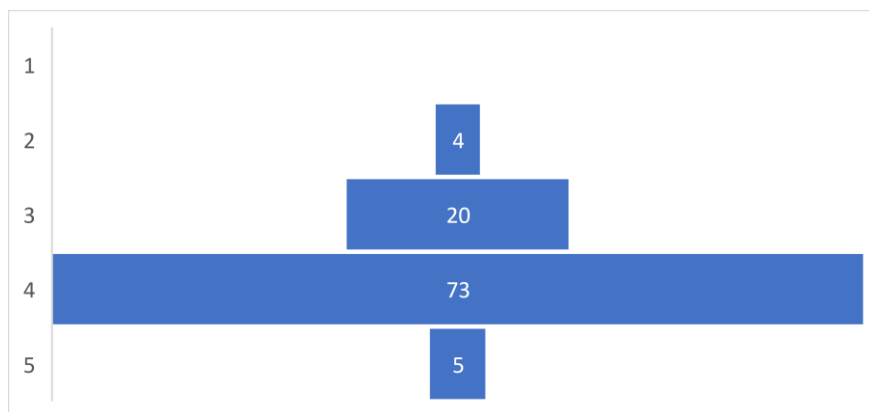


Figure 22. FPS Service Delivery Satisfaction Rating

### **Aadhar enabled Public Distribution System (AePDS) Information**

**Aadhar Linking:** 100% of the respondents reported having linked their Aadhar card and are aware of the AePDS.

**Problems with AePDS:** 65% of the respondents reported no issues with the system. However, 21% of the respondents reported biometric issues and 8% reported Aadhar seeding and 5% reported iris recognition issues.

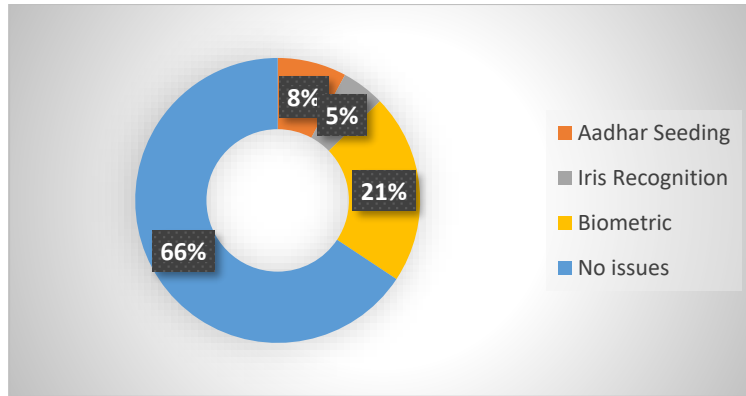


Figure 23. AePDS Issues

**Grain lifting information:** 44% of the respondents reported getting a receipt by the FPS dealer on taking the grains and 23% reported message on their phone while 33% reported no kind of intimation at all.

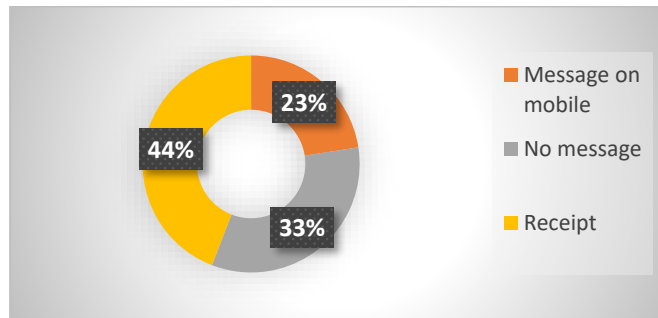


Figure 24. Successful Grain Lifting Message

**Grain receiving:** 60% of the respondents were getting grains in first 7 days of the month and 32% reported getting the grains in the first 10 days of the month. The rest were getting grains after 10 days.

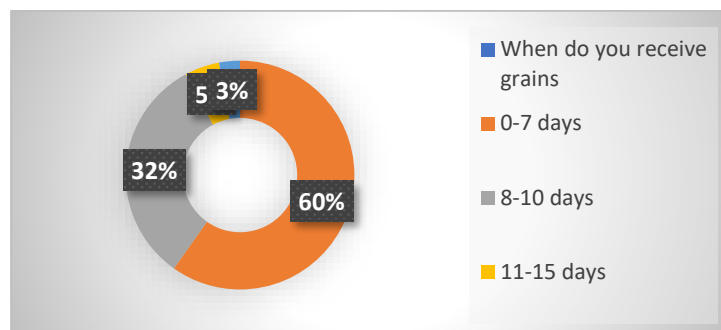


Figure 25. Time of Receiving of Grain (day of month)

**AePDS overall rating:** More than 80% of the respondents reported that they were satisfied with the AePDS system showing a high approval rating.

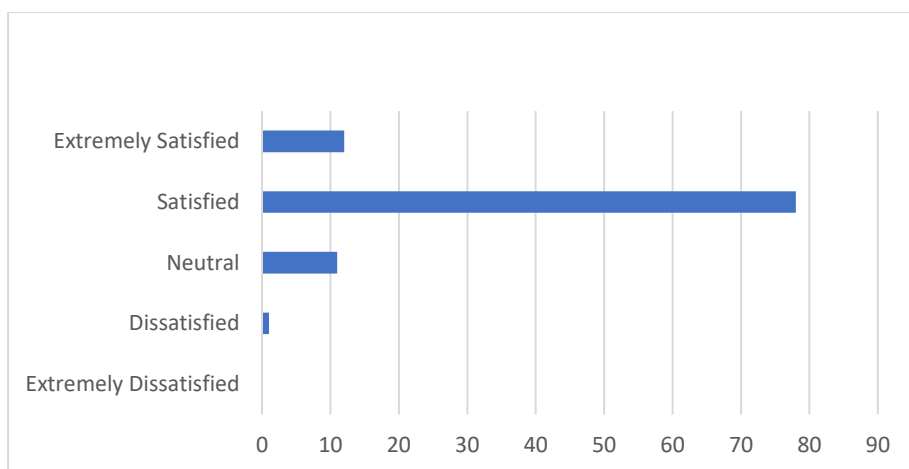


Figure 26. AePDS Overall Rating

**e-Weighing rating:** More than 80% of the respondents were satisfied with the e-Weighing system as they were getting more grains now.

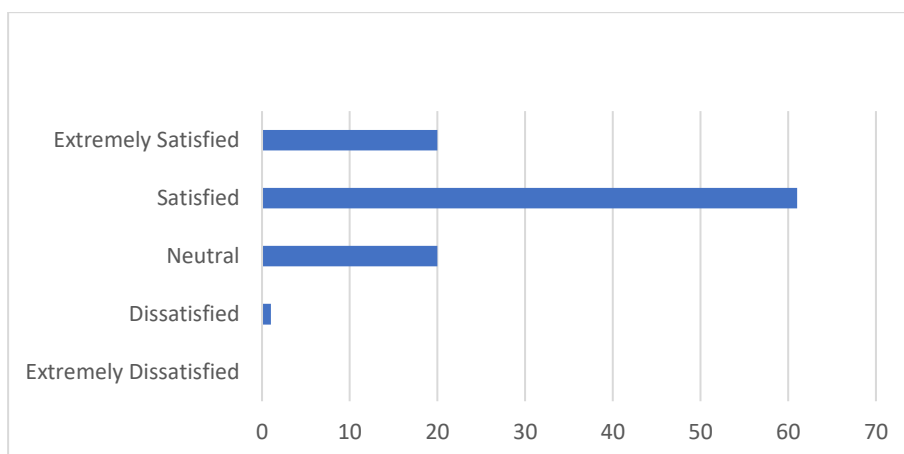


Figure 27. e-Weighing Rating

Table 2. Pre-AePDS vs AePDS comparison (End Beneficiaries)

Percent of Total Respondents →	Yes (%)	No (%)
<b>Has grain weighing improved</b>	97%	3%
<b>Has grain quality improved</b>	88%	12%
<b>Has accountability increased</b>	89%	11%
<b>Has transparency increased</b>	77%	23%
<b>Has knowledge gap reduced</b>	55%	45%
<b>Has bogus/fake ration cards decreased</b>	94%	6%

<b>Are grains timely distributed</b>	97%	3%
<b>Has grievance redressal improved</b>	67%	33%

It can be seen from the table that there is considerable increase in the grains weighed and the quality of grains as reported by the beneficiaries. People also feel that the accountability has also increased. The timeliness of the grain distribution has increased significantly due to the technological advancements and the implementation of AePDS. It is worth noting that beneficiaries reported that the fake ration cards have reduced due to the government initiative of linking Aadhar with the ration card. However, it must be noted that there still exists a knowledge gap due to the complexity of technology now and the grievance redressal mechanism also needs to improve.

### **Beneficiary Satisfaction using Service Quality (SERVOQUAL) Model:**

#### **Reliability test-**

Stability, equivalency and consistency are attributes of reliability. Cronbach's Coefficient Alpha is frequently used to determine consistency (Cronbach,1951). A popular metric for assessing reliability, Cronbach's Alpha provides an indication of the consistency of the instrument. For the variables under investigation, an adequate degree of dependability is usually indicated by a Cronbach's Alpha value of 0.700 or higher. A value of less than 0.7 indicates that the responses are less reliable.

The formula:

$$\text{Cronbach's Alpha} = k/(k-1) \times (1 - \sum \text{Variance of Individual Items} / \text{Total Variance})$$

Where, k=number of questions in the questionnaire

Through an analysis of the test's Cronbach's Alpha values, this study seeks to determine the reliability of several important characteristics such as Assurance, Empathy, Responsiveness, Empathy and Tangibility.

Cronbach's Alpha was calculated for each of the characteristics in the questionnaire and the results have been displayed in the table below.

Table 3. Cronbach's Alpha Value (calculated)

	<b>Cronbach's Alpha Value</b>
<b>Tangibles</b>	0.727
<b>Reliability</b>	0.733
<b>Responsiveness</b>	0.825
<b>Assurance</b>	0.721
<b>Empathy</b>	0.723

It can be seen that the Cronbach's alpha value for each of the characteristics is more than 0.7 indicating that there is internal consistency among the responses and the responses are reliable.

### Gap Analysis:

Now that we have looked into the Cronbach's Alpha test, we will now move on to the results obtained from the SERVQUAL model. The SERVQUAL score or gap is obtained by subtracting Expectations from Perceptions. If the gap score is negative, it indicates that the beneficiaries are not satisfied with the services provided. If the gap is zero, it indicates that the services provided have met expectations and if the gap is positive, it indicates that the services have exceeded expectations. The results have been displayed in the table below.

Table 4. SERVQUAL Model Scores

Service Quality Dimensions	Mean		SERVQUAL Score (Gap) = P-E
	Expectation (E)	Perception (P)	
<b>Tangibles</b>			
How important it is for you to have good physical facilities (e.g. Sitting space, well-lit rooms etc.) at fair price shops?	3.90	3.14	-0.76
How important it is for you that the technology of AePDS should function properly?	4.48	3.55	-0.93
How important it is for you to have well-mannered staff at FPS shops?	4.45	3.26	-1.19
<b>Reliability</b>			
How important it is for you to have timely delivery of grains?	4.65	4.34	-0.30
How important it is for you to have good quality grains delivered to you?	4.19	3.86	-0.32
How important it is for you to have FPS dealers giving you your full entitlement?	4.57	3.33	-1.24
<b>Responsiveness</b>			
How important it is for you to have employees under AePDS system to respond of your queries?	4.35	3.23	-1.13
How important it is for you to have your grievances addressed by the AePDS system promptly and effectively?	4.39	3.25	-1.14

<b>Assurance</b>			
How important it is for you to have staff who is knowledgeable about AePDS?	4.25	3.18	-1.08
How important it is for you to have your data protected under AePDS system?	3.68	3.10	-0.58
<b>Empathy</b>			
How important it is for you to have FPS staff under AePDS help you with your concerns?	4.44	3.52	-0.92
How important it is for you that AePDS system cares about customer satisfaction?	4.46	3.45	-1.01

We can see here that all the SERVQUAL scores/ Gap are coming negative indicating that PDS services have fallen short of the end beneficiaries' expectations. However, under reliability section we can see that the gap is significantly less in the timely distribution of grains and the quality of grains section compared to other sections indicating that these things have improved a lot and might after sometime even meet the expectations. It is worth noted that although there is a negative score in the aforementioned section, the mean ratings of bot these sections are very high indicating overall satisfaction of the beneficiaries with the grain quality and timeliness. The biggest gaps were seen in the grains obtained from the FPS dealers under the reliability section and in the well-behaved staff at FPS under tangibles section. The mean grain entitlement score is less indicating there is rampant underselling at the fair price shops by the dealers and it has been reported by the beneficiaries that they are not treated very well by the FPS staff leading to a high negative rating.

The individual SERVQUAL scores are listed for each dimension in listed in the table below.

Table 5. SERVQUAL Model Scores (concise)

Service Quality Dimensions	Mean		SERVQUAL Score (Gap) = P-E
	Expectation (E)	Perception (P)	
<b>Tangibles</b>	4.28	3.32	<b>-0.96078431</b>
<b>Reliability</b>	4.47	3.85	<b>-0.62</b>
<b>Responsiveness</b>	4.37	3.24	<b>-1.13</b>
<b>Assurance</b>	3.97	3.14	<b>-0.83</b>
<b>Empathy</b>	4.45	3.49	<b>-0.97</b>

It can be clearly seen that the responsiveness section needs the most improvement owing to the poor mechanism of grievance redressal mechanism. The mechanism for grievance redressal has to be made people friendly in order for people to use it. The score in Reliability section fell due to the quantity of grains received by the beneficiaries scores. There should be stricter mechanisms to check the dealers and ensuring the beneficiaries are getting their full entitlement. The tangibles section needs considerable improvement and an initiative should be taken to educate FPS staff about the need for customer satisfaction and infrastructure should be improved at all FPS to include sitting space for the beneficiaries and make the grain availing experience for them smooth. In the assurance section, PDS official should proactively take steps to educate people about data privacy and security initiatives and at the same time raise awareness about the infrastructure of the AePDS leading to lessening of the knowledge gap that exists. Regarding empathy section, it is very necessary for the FPS staff to listen to the problems of the PDS users and have an empathetic view of it because most of the beneficiaries don't have any knowledge about the system of grain distribution that exists making them vulnerable to cheating by underselling and overcharging them. Also, it should be noted that in order to build trust between an organisation and its customers, it should be the people at organisation who should ensure that the customer is satisfied with their services and then only will the customers trust that organisation. That's why, customer satisfaction metric becomes all the way more important and to make it more trustworthy, the FPS staff should ensure that the beneficiaries are contempt with the services that they are receiving.



### 3.2 FPS dealers and PDS Officials

#### Fair Price Shops observations:

Survey was done for 10 Fair Price Shops in Forbesganj Block and were selected through random sampling. The purpose of visiting the fair price shops was to get an understanding of the level of infrastructure of AePDS they maintain in their shops as well as gauging the extent of problems they face for ensuring the smooth and efficient functioning of the public distribution system. The visit consisted of filling up a questionnaire regarding the demographics and the type of problems they face on a daily basis and beneficiary turnout etc. followed by an in-depth interview of around 30 mins which mainly focused on detailed discussion around the service delivery and the problems faced by FPS owners/dealers and the grievance redressal mechanism that exists in the state. The general consensus is the service delivery has increased in comparison to the pre-AePDS times and now the beneficiaries are getting their entitlements on time and they are of a better quality.

#### Demographics:

**Age and Gender of the dealer/owner-** Average age of the FPS dealers was around 56 years. 80% of the respondents were male and 20% were female.

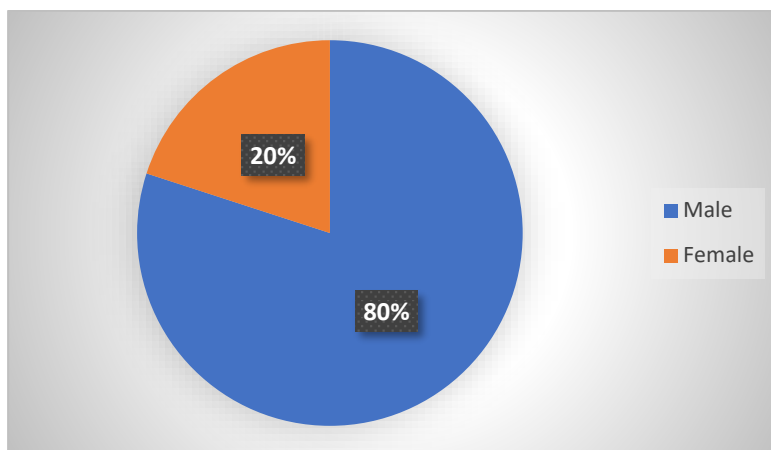


Figure 28. Gender Details (FPS)

**Annual Income-** Most of the respondents said that they were earning less than Rs 60000 annually (50%) or Rs 60000-Rs 100000 (50%).

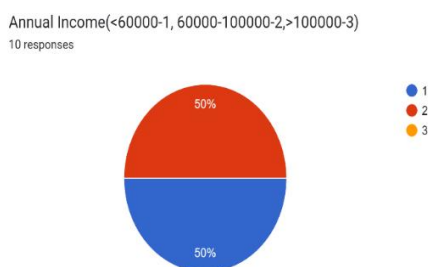


Figure 29. Annual Income Details (FPS)

**Educational Qualification-** Half of the respondents (50%) were graduates.

Education Level ( Illiterate-0, Primary(upto 8th class)-1, Secondary(upto 10th)- 2, Higher Secondary-3, Graduate and post graduates-4)  
10 responses

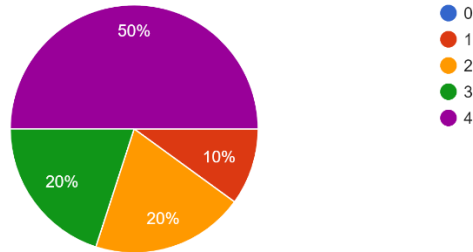


Figure 30. Educational Level (FPS)

### **FAIR PRICE SHOPS DETAILS**

**Age of Shop-** The average age of shops is around 11.4 years indicating that the shops are fairly old to provide us their experience of Pre-AePDS and AePDS system and an objective outcome can be derived from it.

**Beneficiary Turnout-** The average number of people availing services at the fair price shops is around 545 indicating healthy number of beneficiaries who are availing these services.

**Source of income-** Around 70% of respondents said they had other sources of income as well and farming was the other source of income for them.

Do you have any other source of income? (Y-0, N-1)  
10 responses

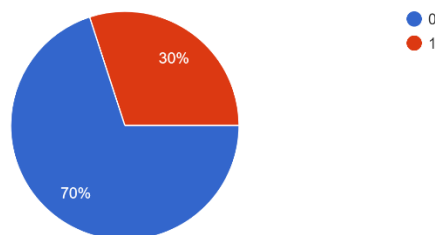


Figure 31. Source of Income (FPS)

**Shop Timings-** The respondents reported that shop was kept open on all days (90%).

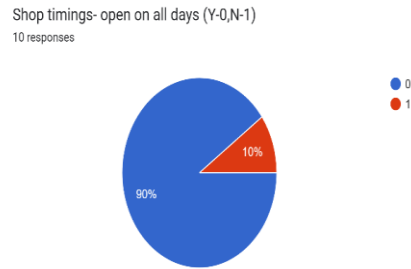


Figure 32. Shop Timings (FPS)

**Shop Ownership-** Most of the respondents (90%) reported that they owned the fair price shops and just one respondent said that he rented the place for fair price shop.

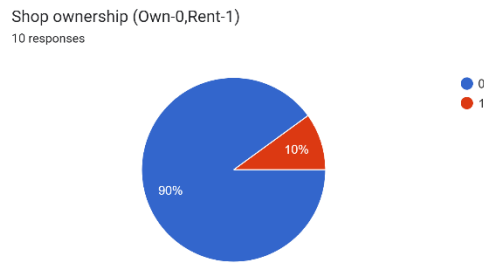


Figure 33. Shop Ownership (FPS)

**AePDS-** 100% of the respondents reported that they are aware of Aadhar enabled Public Distribution System (AePDS).

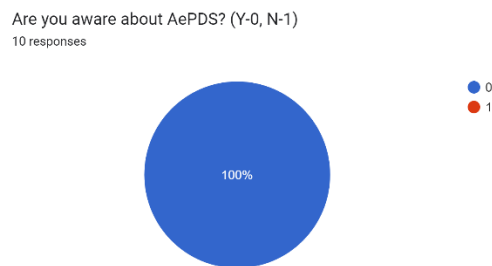


Figure 34. AePDS Awareness (FPS)

80% of the respondents were aware of cashless transactions at the fair price shops.

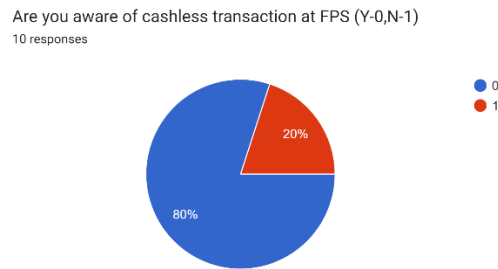


Figure 35. Awareness About Cashless Transactions (FPS)

100% of the respondents were aware of one ration one nation (ORON) scheme and reported those beneficiaries who are not listed at their shops frequently visited them.

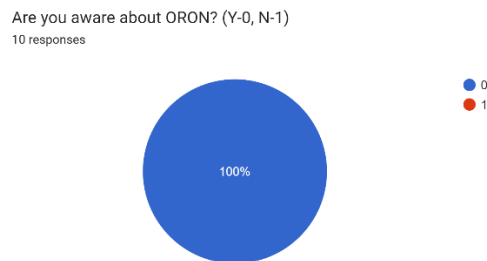


Figure 36. Awareness About One ration one nation (ORON) Scheme (FPS)

100% of the respondents said that they had complaints register to listen to the grievances of the beneficiaries.

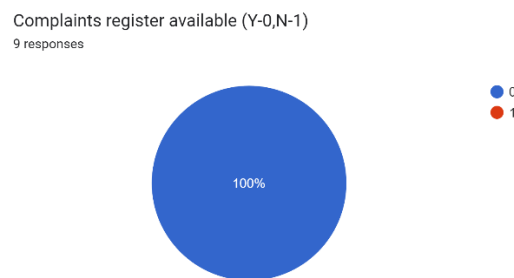


Figure 37. Availability of Complaints Register (FPS)

80 % of the respondents faced some kind of issue with the AePDS system.

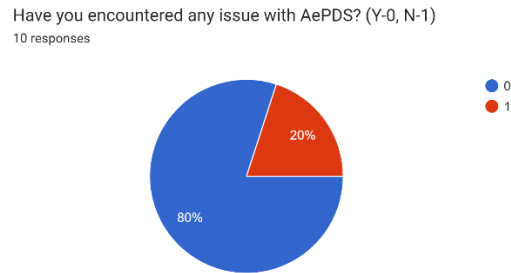


Figure 38. Issues with AePDS (FPS)

The problems ranged from connectivity issue to e-PoS and to power issues. Although, majority of the cases were related to power issues.

100% of the respondents said they distributed both rice and wheat.

100% of the respondents reported that vigilance committee visits their shops once every month.

The respondents were asked to rate their experiences with AePDS and e-weighing system on a scale of 1-5 with 1 being extremely dissatisfied and 5 being extremely satisfied. The mean rating for AePDS stood at 3.5 indicating a positive response towards AePDS and the mean rating for e-weighing system stood at 3.8 indicating satisfied with the system. This goes on to show that these new technological innovations have not just empowered the end beneficiaries but has also empowered the fair price shops dealers/ owners.

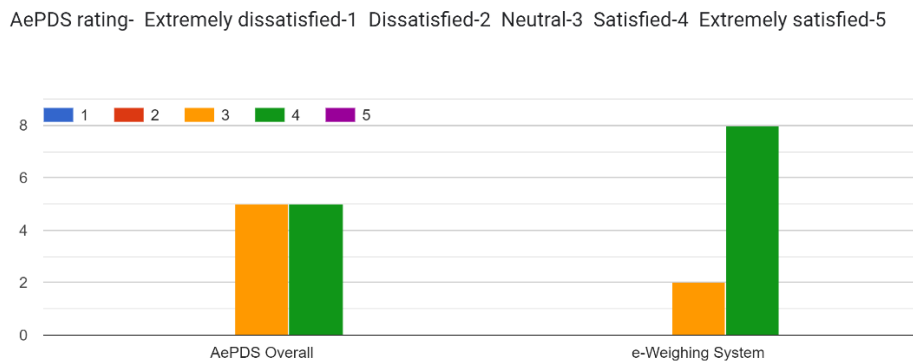


Figure 39. AePDS Satisfaction Rating (FPS)

Table 6. Pre-AePDS and AePDS comparison (FPS Dealers)

Percent of total respondents→	Yes (%)	No (%)
Has grain weighing improved	100%	0%
Has grain quality improved	70%	30%
Has transparency increased	70%	30%
Has bogus/fake ration cards decreased	90%	10%
Are grains timely distributed	100%	0%
Has grievance redressal improved	70%	30%
Has knowledge gap reduced	50%	50%

**Observations after in-depth interviews with the Fair Price Shops owners/ dealers:**

- The commission each dealer gets on one kg of grains sold is 90 paise which is very less considering the hard work they put in the distribution of grains. Earlier it used to be 70 paise on every one kg of grain sold but due to continuous protests have been increased to 90 paise. Even this increase is not enough for them to sustain their business as most of the dealers reported that they are running a loss-making business. Most of the dealers have to keep at least one labour to help them in taking out the grains and helping them in ensuring everything goes hassle-free at their shops. They have to pay the workers a fixed salary that creates an extra overhead expense on their shoulders due to which they are not able to break-even. The dealers were not getting the commission every month as reported and they used to get their commission every 2 months or 3 months.
- The infrastructure of fair price shops has to be maintained by the owner/dealer themselves. The government only provides with the e-PoS machine and rest all the facilities like internet connectivity and electricity has to be managed by the owners and there is no help from the government. Some of the dealers reported that there are server issues while uploading the data of the beneficiaries and they have to put in extra money to ensure the bandwidth of the internet is optimum enough for a smooth upload of the data. The dealers who reported power issues had no backup sources to run the machines if the electricity goes out. They said that the distribution work is stopped for that time period altogether. That creates issues in the rural areas of Forbesganj block which are prone to electricity issues.
- The grain allotment for distribution for dealers by the government is done by checking the amount of kgs of grains sold by the dealer in the preceding month. For e.g. If a dealer has managed to sell 100 quintals of grains in a month, they will be allotted 100 quintals of grains by the government. That allotment is the net amount of grains excluding the weight of the sac in which they are kept. Now, when the grains are taken to the fair price shops from State Food Corporation (SFC) warehouses, these grains are weighed including the weight of the sacs in which they are kept. This creates a deficit of around 1-1.5 quintals and leads to losses in the distribution of grains. Additionally, the dealers had to pay for the labour charges for the transportation of the grains from

SFC warehouses to their shops. Also, the SFC officers have some fixed weighing machines only where the grains have to be weighed and there are instances where the dealers were getting less than that of what they were allotted.

- Some beneficiaries give their biometric and don't take the grains in the same month. Instead, they tell the dealers to keep it with them and then they take it out the next month as reported by the FPS dealers. This creates an additional burden on the FPS dealers as they have to ensure the safety of the grains.
- However, the dealers reported that the grievance redressal mechanism is getting better and when they complain to the marketing officer regarding the quality of the grains being bad, the grains are taken back and it is ensured good quality of grains is given to the dealers.

### **PDS Officials observations**

Marketing Officers of three block in Araria District namely Forbesganj, Narpatganj and Araria were interviewed to get their viewpoint on the AePDS system in Araria district and its impact on the public distribution system and its supply chain.

Table 7. Pre-AePDS and AePDS comparison (PDS Officials)

<b>Percent of total respondents→</b>	<b>Yes (%)</b>	<b>No (%)</b>
Has grain weighing improved	100%	0%
Has grain quality improved	0%	100%
Has transparency increased	100%	0%
Has bogus/fake ration cards decreased	100%	0%
Are grains timely distributed	100%	0%
Has grievance redressal improved	100%	0%
Has knowledge gap reduced	100%	0%

The officials maintained that even in pre-AePDS times, the quality of grains used to be good and so, it can't be deduced for sure that quality of grains increased in AePDS. The officials expressed joy over the fact that transparency has increased and genuine beneficiaries are now able to avail their entitlements.

### **Excerpts from the interview:**

- On asked on comments on the state of AePDS in Araria, the officials said that the from administrative perspective, they are now able to track the FPS dealers more easily and also how much beneficiaries are getting, are there any backlogs in the grain distribution and the grievances of the beneficiaries if any. The officials reported that due to technological advancements, the entire system has become 95% leakage proof. People are now getting their entitlements regularly due to biometric. Complains and grievances have reduced. Aadhar details of more than 90% of the residents have been updated in Araria district. Aadhar seeding complaints are the most frequent types of problem

incidences. FPS dealers are reporting complaints regarding grain quality and grain allotment. Due to digitisation, people are now not able to take grains on fake ration cards.

- Regarding raising the awareness regarding PDS among the beneficiaries, regular advertisements using hoardings and fair price shops are shown to the end users to increase their awareness levels.
- Regular inspections are being conducted to identify the work done by FPS dealers and every PDS official is assigned some fair price shops to check and reports are filed for every visit.
- Regarding supply chain issues, the officials reported that they have not been given any authority for technology regulation. That results in delay in any kind of corrections that are required at the ground level. So, decentralisation of technology is one issue that the PDS officials highlighted.



## 4. Recommendations

### 1) **Capacity building initiatives:**

Organizing training courses for PDS employees, officials and other Araria stakeholders is one way to increase capacity. Through these programs, they hope to gain a deeper comprehension of the AePDS, hone their technical abilities, and guarantee the system is implemented successfully. We can see from the results of SERVQUAL test that the most of the issues for the beneficiaries lie in the tangibles section and responsiveness section. The PDS staff needs capacity building programmes to enhance their responsiveness to the issues that are raised by the beneficiaries and also improving the general infrastructure of the fair price shops to enhance the grain lifting experience of the people. Initiatives aimed at increasing capacity concentrate on providing employees with the skills they need to effectively administer the AePDS. Training in data management, technological use, stakeholder involvement and regulatory compliance may be necessary for this. The system can better respond to changing demands, provide better services and improve the results of food security by investing in capacity building.

### 2) **Responsiveness:**

To enhance the responsiveness of the system requires a careful overhauling of the entire system. The PDS staff should have to ensure that the beneficiaries receive their entitlements and are satisfied by the PDS. To better understand the needs, expectations, and concerns of beneficiaries at the community level, PDS officials should schedule frequent meetings and discussions with them. To build a relationship of trust and cooperation between the system's beneficiaries and itself, promote open communication and feedback channels. Start awareness efforts to inform beneficiaries of the Araria district's AePDS's capabilities as well as their rights and entitlements. Utilize a variety of communication platforms, including door-to-door outreach, community gatherings, and local media, to answer recipients' questions and distribute information. Continually track and assess beneficiary satisfaction levels using focus groups, interviews, and surveys. Utilize the input to pinpoint areas that require improvement and put remedial actions in place to improve the Araria district's AePDS's responsiveness and empathy. Grievance redressal mechanisms like online portals, complaint boxes and toll-free helplines are available but the awareness about these things is extremely low. Due to this, beneficiaries are not able to voice any problems or questions regarding the AePDS as can be corroborated from the survey data as well that even if the people are encountering issues with the quantity of grains that they are getting, they were not availing the grievance redressal mechanism. The FPS dealers who are not providing the receipt at the time of lifting of grains should be penalised accordingly.

### 3) **Aadhar enabled Public Distribution System (AePDS):**

Address issues with the AePDS system's data security and privacy. Make that beneficiaries' biometric and demographic information is safeguarded, and that privacy

safeguards are in place to increase confidence in the system. To guarantee that the delivery of goods via AePDS continues uninterrupted, it is imperative to make improvements to the power supply and internet connectivity. Where an uninterrupted power supply from the main grid looks challenging, alternative power sources like solar power and generators among others, can be investigated. It was found from the surveys done in the fair price shops that power infrastructure is seriously lacking. The dealers don't have alternate power sources and that results in delaying of the grain distribution leading to dissatisfaction in the beneficiaries. Using digital enterprises in Public-Private Partnership models may be one way to enhance internet connectivity. Internet connection has to be maintained by the FPS dealers and government doesn't support in this initiative. Due to this, there are multiple issues that crop up like server issues, bandwidth issues, etc. To tackle this issue, it is very imperative that the government takes proactive action and provide necessary support to the dealers to ensure that there are no data related issues and every information is updated as per the rules and there are no delays in it. The fair price shops can be ranked using Service Delivery Index (SDI) so as to get an idea about how the shops are performing and whether the beneficiaries are getting their entitlements or not. This will create an incentive for the FPS dealers to perform better and will also help the PDS officials to check the effectiveness of the system. Decentralisation of technology can also be done so as to empower PDS officials who work at the ground level to use the technology not just for reporting the issues but also rectify them.

**4) Grievance redressal:**

In general, beneficiaries, FPS dealers and department employees do not report many PDS related issues. Nonetheless, the department's proactive steps towards grievance redressal at the FPS level are far from enough. Conversely, FPS dealers knew how the grievance resolution procedure was supposed to work. Numerous people have complained via the helpline or by going to higher-ranking department officials and getting their issues resolved. To verify that the complaint registers have been kept up to date and placed in conspicuous places throughout the shop, the department must conduct surprise inspections of the fair price shops. It must be noted that the almost 90% of the beneficiaries who participated in the survey reported that the FPS dealers were underselling the grains. The vigilance committee should take a proactive action in ensuring that full entitlement is given to the users.

**5) Satisfaction:**

The satisfaction survey conducted gave some insights about the conditions of end beneficiaries and the FPS dealers. The users rated the AePDS system highly but highlighted some points that needs to be improved. The FPS dealers complained about how they were getting less grains from the SFC warehouses and how their grievances were not addressed properly. An independent committee should be formed at the district level to look into the grievances of the FPS dealers regarding the issues with FCI and SFC warehouses. Furthermore, the commission that the FPS dealers get currently on the sale of grains should be increased in order to reduce the incentive for corruption for

them. Another suggestion could be to fix a monthly salary for the FPS dealers so that they can sustain themselves. The government should work proactively to help the dealers with setting up infrastructure and helping them time-to-time with running it. Regarding the end users, 96% of the respondents were aware of one ration one nation (ORON) scheme but most of them were not willing to change to another fair price shop to take their grains. Awareness campaigns should be conducted by the government to encourage the users to shift to other fair price shops if they feel they are not getting good quality grains or less quantity is given. That way their issues are resolved regarding the service delivery.

## 5. Conclusion

There are visible improvements in the functioning of public distribution system after the implementation of AePDS. It can be found out from the study that the grain quality has improved a lot and the failings of system prior to AePDS implementation have reduced drastically. The respondents reported a very high penetration of mobile phone and bank accounts showing that government initiatives are easily accessible now and people are availing it. There is very degree of awareness about the entitlements and one ration one nation scheme (ORON) indicating that the beneficiaries are now becoming aware of their rights and in the process are able to hinder systemic corruption. Respondents also reported a high degree of satisfaction with the AePDS system and e-weighing system indicating that the technological advancements are proving to be beneficial for the people. The model used to analyse the effectiveness of AePDS in terms of satisfaction from the point-of-view of the end beneficiaries is SERVQUAL model and the results it yielded provide a clear picture of where is the system doing a good job and where is it lacking. This model is based on five pillars namely- tangibles, reliability, responsiveness, assurance and empathy. Furthermore, questions are prepared in the format of expectations and perceptions and the ratings are to be given on a 1-5 Likert scale and then the difference between perceptions and expectations is calculated which is also known as SERVQUAL Score or Gap. We are able to find out the areas that required attention and the areas which are doing good. It is clear from the responsiveness section that major improvement is urgently needed, mostly because of the shortcomings in the grievance redressal procedure. Because of its unfriendliness, beneficiaries are unable to effectively utilize the current system to resolve their complaints and challenges. More of a people-centric approach is needed to solve this, making sure that the grievance redressal procedure is transparent, easily accessible, and sensitive to the requirements of the beneficiaries. Scores in the reliability portion decreased, mostly because of problems with the amount of grains that recipients received. To guarantee that beneficiaries receive their entire entitlement without any inconsistencies, it is imperative to reinforce the systems in place to oversee and control dealers. Stricter control and accountability procedures can be put in place to help lessen the effects of poor management or under delivery. Enhancing the whole user experience at FPS will require significant improvement in tangibles, another crucial component. The service delivery process can be greatly enhanced by training FPS employees on the value of client happiness and by providing sufficient infrastructure, such as sitting arrangements for beneficiaries. Beneficiaries' grain availing experience can be streamlined and made more convenient and user-friendly by making FPS a more friendly and effective place to work. Proactive actions are required in the assurance area to inform beneficiaries about data privacy and security protocols. Enhancing cognizance regarding the structure and operation of the AePDS helps close the knowledge chasm and foster beneficiary confidence. PDS authorities can inspire trust in the recipients of their data security and privacy by maintaining transparency and actively interacting with the community. In order to increase beneficiary satisfaction and system trust, empathy is essential. FPS employees have a duty to listen empathetically to PDS users' worries and issues because many recipients are ignorant of the distribution system and hence open to abuse. FPS employees may better meet beneficiary needs and create relationships based on mutual respect and trust by taking a caring

and understanding attitude. Organizations must place a high priority on customer-centric processes and make sure recipients are happy with the services they receive in order to promote trust and happiness. Metrics measuring customer satisfaction are crucial for determining areas for improvement and assessing how well services are delivered. In summary, improving the success of the AePDS in Araria, Bihar will need addressing the areas of improvement indicated in tangibles, assurance, responsiveness, and empathy. The AePDS has the potential to enhance its efficiency, dependability, and user-friendliness while satisfying the food security requirements of the Araria community through the implementation of focused strategies aimed at enhancing service delivery, transparency and beneficiary satisfaction. To sum up, the implementation of the AePDS in Araria has yielded encouraging outcomes in terms of decreasing grain leakage and enhancing the distribution of basic necessities. But there are still a lot of obstacles to overcome and room for development, especially when it comes to meeting the unique requirements and difficulties faced by the community, expanding the system's accessibility and reach, and improving the ability and response of PDS officials. In order to guarantee the AePDS in Araria, Bihar, is sustainable and effective over the long run, it will be imperative to address these concerns.

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**Annexure: Questions asked from the stakeholders involved in Public  
Distribution System**

**End Beneficiaries**

Demographic Information:

- Age
- Size of Household
- Gender
- Education Level
- Occupation
- Religion
- Caste
- Annual Income
- Ownership of Vehicle
- Home Ownership
- Mobile Phone Ownership
- Bank Account Ownership
- Toilet
- Whether debt taken?

FPS and PDS Questions:

- Type of Card
- Entitlement Awareness
- Awareness about One Ration One Nation (ORON) Scheme
- Type of Grains taken
- Aailed Complaints Lodging Facility
- Mode of Information of Grain Distribution
- Grain receiving date
- Mode of Payment at FPS
- FPS dealers Underselling
- FPS dealers Overcharging
- Vigilance Cell Awareness
- FPS Service Delivery Rating

AePDS Information:

- Aadhar Linking
- AePDS Awareness
- AePDS Issues
- Grain Lifting Success Message
- AePDS Rating

**SERVOUAL Questionnaire**



### **Tangibles:**

- 1) **Expectation-** How important it is for you to have good physical facilities (e.g. Sitting space, well-lit rooms etc.) at FPS centres?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** What do you think of existing physical facilities at FPS centres?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 2) **Expectation-** How important it is for you that the technology of AePDS should function properly?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** What do you think of existing technology used at FPS centres in terms of their functionality?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 3) **Expectation-** How important it is for you to have well-mannered staff at FPS shops?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** What do you think of existing behaviour of FPS staff?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

### **Reliability:**

- 1) **Expectation-** How important it is for you to have timely delivery of grains?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the AePDS system in delivering grains timely?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 2) **Expectation-** How important it is for you to have good quality grains delivered to you?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** What do you think of existing quality of grains that you are given in the AePDS system?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 3) **Expectation-** How important it is for you to have FPS dealers giving you your full entitlement?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the current state of FPS dealers in terms of giving you your full entitlement?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

**Responsiveness:**

- 1) **Expectation-** How important it is for you to have employees under AePDS system to respond of your queries?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the current responsiveness of the employees under AePDS system?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 2) **Expectation-** How important it is for you to have your grievances addressed by the AePDS system promptly and effectively?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the effectiveness of AePDS system in grievance redressal of the PDS beneficiaries?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

**Assurance:**

- 1) **Expectation-** How important it is for you to have staff who is knowledgeable about AePDS?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the knowledge level of FPS staff?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

- 2) **Expectation-** How important it is for you to have your data protected under AePDS system?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the effectiveness of AePDS system in your data protection?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

**Empathy:**

- 1) **Expectation-** How important it is for you to have FPS staff under AePDS help you with your concerns?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception-** How do you perceive the FPS staff in helping you resolve your concerns?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

2) **Expectation**- How important it is for you that AePDS system cares about customer satisfaction?

(Extremely unimportant-1, Unimportant-2, Neutral-3, Important-4, Extremely Important-5)

**Perception**- How do you perceive the current AePDS system in terms of customer satisfaction?

(Extremely bad-1, Bad-2, Neutral-3, Good-4, Extremely Good-5)

### **FPS dealers/owners**

- 1) Shop information:
  - Age of shop
  - Beneficiary turnout
  - Shop timings
  - Any other sources of income
- 2) Technical Infrastructure:
  - Network connectivity
  - Cashless transaction facilities
  - Attendance system
  - Rate board with necessary information
  - Complaints book
  - Constraints faced by the owners

### **PDS Officials**

Questions asked to Marketing officer:

- State of AePDS in your block and your assessment of it. Most frequent problems that appear in the field.
- Areas with high illiteracy and more AAY holders, what unique challenges did you face?
- What is your take on limit of technology on tackling issues of people?
- Knowledge gap between people and the administration and how to fill it up?
- Grievance redressal mechanism
- What are your criteria of evaluating FPS shops?
- Vigilance committee.

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## EFFECTIVENESS OF Aadhar ENABLED PUBLIC DISTRIBUTION SYSTEM(AePDS) IN FORBESGANJ BLOCK OF ARARIA

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